Our Reference: NNA-116-B PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Title:	APPARATUS AND METHOD FOR CONTROLLING A MOTOR

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

M.S. Issue Fee
Commissioner for Patents
P.O. Box 1450
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Sir:

If any charges or fees must be paid in connection with the following communication, they may be paid out of our Deposit Account No. 25-0115.

In response to the Notice of Allowance mailed January 15, 2009, Applicants respectfully submit that the reasons for allowance described by the Examiner rely on an element not recited in the independent claims of the present invention.

Applicants submit that claim 1 is allowable because the prior art fails to teach or suggest a motor control device for use in controlling an electric motor driven by a power generator that is adapted to output a square-wave voltage and a PWM-wave voltage in response to a switching control signal, comprising a first input adapted to receive a signal indicative of a torque instruction value, a second input adapted to receive a signal indicative of the rotational speed of the electric motor and a controller responsive to the first and second inputs and adapted to: determine the existence of a switching condition based on the first and second inputs; if a switching condition exists, generate a voltage control signal to lower the output voltage of the power generator; and when the output voltage of the power generator is below a specified voltage

level, generate the switching control signal to cause the power generator output to switch from the PWM-wave voltage output to the square-wave voltage output.

Further, and with respect to independent claim 7, the prior art fails to teach or suggest a motor control device that controls an alternating current motor that drives the driving wheels of a vehicle based on a torque command value, comprising a power generator driven by an internal combustion engine and adapted to supply power to the alternating current motor, a motor velocity sensing device that detects the rotational speed of the alternating current motor, an inverter that is disposed between the power generator and the alternating current motor, a square-wave voltage driver that controls the inverter to produce a square-wave voltage from the power generated by the power generator and applies the square-wave voltage to the alternating current motor to put the alternating current motor in a square-wave voltage-driven state, a pulse-width-modulated wave driver that controls the inverter to produce a pulse-width-modulated wave voltage from the power generated by the power generator and applies the pulse-width-modulated wave voltage to the alternating current motor to put the alternating current motor in a pulse-width-modulated wave voltage-driven state, a switching decision section that determines that the conditions for switching from the pulse-width modulated wave voltage-driven state to the square-wave voltage-driven state have been met based on the rotational speed of the alternating current motor detected by the motor velocity sensing device, a voltage controller that decreases the voltage generated by the power generator when the switch controller has determined that the conditions for switching from the pulse-width modulated wave voltage-driven state to the square-wave voltage-driven state have been met, a voltage sensor that detects that the voltage generated by the power generator has dropped below a specified voltage threshold value and a square switching section to switch from the pulse-width modulated wave voltage-driven state to the square-wave voltage-driven state when the switching decision section has determined that the conditions for switching from the pulse-width modulated wave voltage-driven state to the square-wave voltage-driven state have been met and when the voltage sensor has detected that the voltage generated by the power generator has dropped below the specified voltage threshold value.

The prior art also fails to teach or suggest, as described in independent claim 13, a vehicle comprising an electric motor, a power generator that is adapted to drive the electric motor

with a square-wave output and a PWM-wave output in response to a switching control signal, a first input signal indicative of a torque instruction value, a second input signal indicative of the rotational speed of the electric motor and a controller adapted to: determine the existence of a switching condition based on the first and second inputs; if a switching condition exists, lower the output voltage of the power generator; and when the output voltage of the power generator is below a specified voltage level, generate the switching control signal to cause the power generator output to switch from the PWM-wave output to the square-wave output.

With respect to independent claim 18, the prior art fails to teach or suggest a motor control device that controls an alternating current motor that drives the driving wheels of the vehicle based on a torque command value, comprising a power generating means for generating power to the alternating current motor, motor velocity sensing means for detecting the rotational speed of the alternating current motor, square-wave voltage driving means for producing square-wave voltage from the power generated by the power generating means and applying the square-wave voltage to the alternating current motor to put the alternating current motor in a square-wave voltage-driven state, pulse-width-modulated wave driving means for producing a pulse-width-modulated wave voltage from the power generated by the power generating means and applying the pulse-width-modulated wave voltage to the alternating current motor to put the alternating current motor in a pulse-width-modulated wave voltage-driven state, switching decision means for determining that the conditions for switching from the pulse-width modulated wave voltage-driven state to the square-wave voltage-driven state have been met based on the rotational speed of the alternating current motor detected by the motor velocity sensing means; voltage decreasing means for decreasing the voltage generated by the power generating means when the switching decision means has determined that the conditions for switching from the pulse-width modulated wave voltage-driven state to the square-wave voltage-driven state have been met, voltage decrease sensing means for detecting that the voltage generated by the power generating means has dropped below a specified voltage threshold value and a square-wave switching means for switching from the pulse-width modulated wave voltage-driven state to the square-wave voltage-driven state when switching decision means has determined that the conditions for switching from the pulse-width modulated wave voltage-driven state to the square-wave voltage-driven state have been met and when the voltage decrease

sensing means has detected that the voltage generated by the power generating means has dropped below the specified voltage threshold value.

The prior art also fails to teach or suggest a method for controlling an electric motor driven by a power generator that is adapted to output a square-wave voltage and a PWM wave voltage as described in claim 24, which comprises in combination determining whether a switching condition exists based on the rotation speed of the electric motor and a torque instruction value, lowering the voltage output of the power generator if a switching condition exists and switching the output of the power generator from PWM-wave voltage to square wave voltage if a switching condition exists and the output of the power generator is below a specified level.

Applicants respectfully request entry of these Comments in the Application.

Very truly yours,

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